

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of	)	<b>MAIL STOP</b>
Koichi Shibata et al.	)	<b>APPEAL BRIEF - PATENTS</b>
Application No.: 10/772,436	)	Group Art Unit: 2625
Filed: February 6, 2004	)	Examiner: Mark R Milia
For: IMAGE PROCESSING	)	Appeal No.: _____
APPARATUS FOR RECEIVING A	)	
REQUEST RELATING TO IMAGE	)	

**APPEAL BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated March 1, 2011 rejecting claims 1-23, which are reproduced as the Claims Appendix of this brief.

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The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.17 and 41.20 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

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I. Real Party in Interest

Konica Minolta Business Technologies, Inc. is the real party in interest, and is the assignee of Application No. 10/772,436.

II. Related Appeals and Interferences

No other appeal, interference or judicial proceeding is known which will affect or be directly affected by, or have bearing on, the Board's decision in this appeal.

III. Status of Claims

Claims canceled: None

Claims withdrawn from consideration but not canceled: None

Claims pending: 1-23

Claims allowed: None

Claims rejected: 1-23

Claims on appeal: 1-23

IV. Status of Amendments

No Amendments were filed subsequent to the Office Action dated March 1, 2011.

V. Summary Claimed Subject Matter

The claimed subject matter is directed to an image processing apparatus including an external API program wherein the external API (application program interface) converts a received request to a command supported by a first API. The

external API provides pre-packaged functionalities in a control layer of the image processing apparatus to an external source, such as a PC. However, the external API allows an external program, which resides in a device external to the image processing apparatus, to bypass application programs in the application layer of the image processing apparatus. Using an image processing apparatus according to the claimed subject matter, a developer of an external program can call pre-packaged functionalities of the control layer, with the knowledge of the external API. As such, the developer is not limited to the application programs provided in the application layer of the image processing apparatus. Furthermore, the developer is not burdened with learning detailed knowledge (e.g., syntax, and parameters) of each of the individual functions in the control layer.

Referring to Fig. 1 of the present application, the control layer 20 includes a kernel 21, an Image Job Controller (IJC) module 22 for controlling operations of each device, an Input-Output interface module (IO) 23 for controlling communications with an external device, and IO/IJC API 24. The application layer 30 includes application program 31-35 and external API program 36 in the application layer, each of which makes an access to the IO/IJC API 24 in order to drive the devices. The external API application 36 according to Appellants' exemplary embodiments is a program for controlling operations of each device according to a request relating to image processing received from an external device.

According to the present disclosure, in addition to the IO/IJC API 24 which is a collection of functions callable by the application programs stored in the MFP, the external API 361 is provided so that collections of functionalities of the control layer 20 are available to an external device, without going through the application programs 31-35. The external API 361 is released publicly to external users (for

example, software developers of external programs) in advance, so that the external users are able to develop software for accessing functions of the control layer 20, without being restrained to the applications programs in the application layer, and without being burdened with learning knowledge of each function in the control layer 20..

The present disclosure has described the present invention by way of numerous embodiments. However, it is naturally appreciated that the present invention is not limited to those specific embodiments described above, and various modifications may be made.

Pursuant to 37 C.F.R. §41.37(1)(c)(v), the subject matter of independent claims 1, 7, 13 and 18 is cross-referenced to the specification in the following table. The following table is not to be construed as a representation that the portions of the disclosure identified below constitute the sole basis for support for the claimed subject matter.

Claim	Disclosure
1. An image processing apparatus comprising:	
a hardware resource that includes at least one of an image forming unit, a read unit, and a display unit;	Page 8, paragraph 0028; Fig. 1, the device layer 10
a control layer;	Page 8, paragraph 0028; Fig. 1, the control layer 20
an external API (application program interface) program; and	Page 11, paragraphs 0039 and 0040; Fig. 1, the external API 361
an application group including one or more application programs stored in an application layer,	Page 22, paragraphs 0083; Fig. 1, the application layer 30
wherein the hardware resource, the control layer, the external API program and the application group are	Page 8, paragraph 0028;

arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and	Fig. 1, the device layer 10, the control layer 20, the external API 361, and the application layer 30
the application group including the one or more application programs and the external API program are superordinate to the control layer,	Page 8, paragraph 0028; Fig. 1, the control layer 20, the external API 361, and the application layer 30
the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request, and	Page 3, paragraph 0007; Fig. 1, the control layer 20, the external API 361, and the application layer 30
the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer;	Page 13, paragraph 0051- page 17, paragraph 67; Figs. 1-3
wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.	Page 11, paragraphs 0041 and 0042
7. An image processing apparatus comprising:	
a hardware resource including at least one of an image forming unit, a read unit, and a display unit;	Page 8, paragraph 0028; Fig. 1, the device layer 10
a control layer;	Page 8, paragraph 0028; Fig. 1, the control layer 20
an external API (application program interface) program; and	Page 11, paragraphs 0039 and 0040; Fig. 1, the external API 361
an application group including one or more application programs stored in an application layer,	Page 22, paragraphs 0083;

	Fig. 1, the application layer 30
wherein the hardware resource, the control layer, the application group and the external API program are arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and the application group including the one or more application programs and the external API program are superordinate to the control layer,	Page 8, paragraph 0028; Fig. 1, the device layer 10, the control layer 20, the external API 361, and the application layer 30
the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program, and controls the hardware resource to perform image processing based on the received first request, and	Page 23, paragraph 0088 – page 24, paragraph 0090; Fig. 6
the external API program includes a second API for receiving a second request relating to image processing from an external source and a third request relating to image processing from the one or more application programs, converts, on receiving either of the second and third requests, the received request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer;	Page 24, paragraph 0091 – page 33, paragraph 0125; Figs. 6 and 7
wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.	Page 11, paragraphs 0041 and 0042
13. An image processing apparatus, comprising:	
a hardware resource including at least one of an image forming unit, a read unit, and a display unit;	Page 8, paragraph 0028; Fig. 1, the device layer 10
a control layer;	Page 8, paragraph 0028; Fig. 1, the control layer 20
an external API (application program interface) program; and	Page 11, paragraphs 0039 and 0040; Fig. 1, the external API 361
an application group including one or more application programs stored in an application layer,	Page 22, paragraphs 0083; Fig. 1, the application layer

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wherein the control layer is arranged between the hardware resource and the application group including the one or more application programs, and the external API program is arranged superordinate to the one or more application programs in the application group in a hierarchical architecture,	Page 8, paragraph 0028; Fig. 1, the device layer 10, the control layer 20, the external API 361, and the application layer 30
the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request,	Page 34, paragraph 0128 – page 35, paragraph 0131, Fig. 10
the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command to an appropriate one of the control layer, and the one or more application programs, depending on the requested processing, the command passed to the control layer serving as the first request,	page 35, paragraph 0132 - page 46, paragraph 0174; Figs. 10-12
wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.	Page 11, paragraphs 0041 and 0042
18. An image processing apparatus comprising:	
a hardware resource that includes at least one of an image forming unit, a read unit, and a display unit;	Page 8, paragraph 0028; Fig. 1, the device layer 10
a control layer;	Page 8, paragraph 0028; Fig. 1, the control layer 20
an external API (application program interface) program; and	Page 11, paragraphs 0039 and 0040; Fig. 1, the external API 361
an application group including one or more application programs stored in an application layer,	Page 22, paragraphs 0083; Fig. 1, the application layer



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wherein the hardware resource and the programs are arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and the one or more application programs and the external API program are superordinate to the control layer,	Page 8, paragraph 0028; Fig. 1, the device layer 10, the control layer 20, the external API 361, and the application layer 30
the control layer includes a first API for receiving a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request, and	Page 34, paragraph 0128 – page 35, paragraph 0131, Fig. 10
the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing one or more application programs of the application group stored in the application layer;	page 35, paragraph 0132 - page 46, paragraph 0174; Figs. 10-12
wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API,	Page 11, paragraphs 0041 and 0042
wherein the software is used to control the hardware resource to perform processing that is not executable by the hardware resource under control of any of the one or more application programs.	page 34, paragraph 0128 - page 46, paragraph 0174; Figs. 10-12

#### VI. Grounds of Rejection to be Reviewed on Appeal

The issue to be decided on this appeal is whether claims 1-23 are obvious under 35 U.S.C. §103(a), or alternatively, are anticipated under 35 USC 102(e) over US Patent Publication No. 2004/0070782, hereinafter Mihira.

## VII. Argument

### Independent Claims 1, 7, 13 and 18

Claim 1 recites an image processing apparatus comprising:

the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request, and

the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer;

wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.

An example of the claimed image processing apparatus is an MFP (multifunction peripheral) capable of a plurality of jobs relating to image processing, including the scan job, copy job, print job, and FAX job. Referring to Fig. 1 of the present application, an MFP (multifunction peripheral) 1 has a hierarchical architecture with a device layer (hardware resource) 10 as the bottommost layer, a control layer 20 directly controlling the device layer 10, and an application layer 30 as the topmost layer. The MFP 1 is connected to an external device, e.g., a PC (personal computer) 50 via a network.

The control layer 20 includes a kernel 21, a module (IJC: Image Job Controller) 22 for controlling operations of each device, an interface module (IO: Input-Output) 23 for controlling communications with an external device, and IO API

and IJC API (hereinafter, referred to collectively as "IO/IJC API") 24. The control layer 20 acts as an OS.

The IO/IJC API 24 is an API for providing functionality of the IJC 22 and the IO 23 to applications 31-36 residing on the application layer 30. To be more specific, the IO/IJC API 24 is a collection of functions callable by each application in order to access functionality of the IJC 22 and IO 23.

The application layer 30 includes applications 31-36, each of which makes an access to the IO/IJC API 24 in order to actually drive the devices.

The external API application 36 controls operations of each device according to a request relating to image processing received from an external device. The external API application 36 includes an external API 361, an XML (Extensible Markup Language) converter 362, and an API converter 363.

The external API 361 is an API for providing functionality of the control layer 20 to an external device (the PC 50, for example), and is a collection of functions callable by the PC 50 in order to access functionality of the control layer 20. The external API 361 is released publicly to external users (for example, software developers) in advance. With reference to the released external API, the external users are able to develop software for accessing functionalities of the control layer 20.

The external API 361 is a collection of a plurality of sets of functions that are predefined as the IO/IJC API 24. For example, when a series of operations performed by a specific device is defined in the IO/IJC API 24 as functions A, B, and C, the three functions are defined collectively as a function D in the external API 361 (i.e., calling the function D causes the functions A, B, and C to be called).

With provision of the external API application 36 described above, it is possible to cause the MFP 1 from an external source to perform functionality that the applications provided within the MFP 1 are incapable of. For example, the scanner 12 is capable of scanning an image of a document at any resolutions of 1; 200; 600; and 400 dpi (dots per inch). Yet, the scan application 33 is incapable of receiving a user selection of scanning resolution (for example, the resolution is fixed to the lowest one of 400 dpi). Here, by publicly releasing the external API 36 that includes information necessary for performing a scan job at a desired resolution, external users are allowed to develop software that transmits to the MFP 1, XML data containing a command and other data necessary for the scan job.

As explained above, in an image processing apparatus according to the claimed subject matter, with the first API, when a processing request is directed to an application provided in the image processing apparatus, the processing request is passed to that application. With the second API, the image processing apparatus is capable of transmitting an appropriate command and other data from the PC 50 to perform functions without activating the corresponding pre-packaged applications. The second API converts a received request to a command supported by the first API. Therefore, a software developer is able to call collections of functions in the control layer, without the burden of learning detailed knowledge of individual functions in the control layer. As such, with the first API and the second API, the flexibility and scalability of the image processing apparatus according to the claimed subject matter are improved.

Mihira does not disclose an image processing apparatus as recited in claim 1.

In Mihira, the WSF 27 has an API 51 by which processing requests can be received from the WEB page application 25 and SOAP communication application

26. Further, the SF 28 has an API 52 by which processing requests can be received from the WSF 27. When receiving processing requests through the API 51 from the WEB page application 25 and SOAP communication application 26, the WSF 27 selects a respective one of the SFs 28 according to the processing requests. Then, the WSF 27 sends the processing requests thus received to the selected SFs 28 via the API 52. According to Mihira, upon receiving the processing requests via the API 52, the SFs 28, calls other applications to execute processing in response to these requests.

Fig. 1 of Mihira illustrates two SFs 28, one of which acts as a document management service 123, and the other of the SFs 28 acts as a printing service 130. Both document management service 123 and a printing service 130 are application software installed in the composite machine 1. See Mihira: paragraphs 0062 and 0090.

In Mihira, external applications, such as the web page application 25, can request processing via API 52 which is a collection of functions that call various application programs in the application layer 5. Mihira, however, does not disclose that the external applications can request processing using an API program that converts the request to a command supported by a control layer API, and passes the command as the first request to the control layer.

It is asserted, in the Office Action dated March 1, 2011, that "Mihira states that NIC 69 is an interface device connecting the composite machine 1 with a communication network such as the Internet and as such a network apparatus 100 can perform communication with composite machine 1 via the Internet to communicate with document management service 123 and printing service 130, both of which may be provided in the control service layer 9. Therefore, after a request is

received by external API (NCS 31) via NIC 69 the network apparatus 100 communicates directly with control service layer 9 which provides document management service 123 and printing service 130 thereby bypassing the one or more application programs (paragraph 93 and 99)" See the Office Action: page 3, the first paragraph.

In the Office Action, it is further asserted that in Mihira, "after a request is received by external API (NCS 31) via NIC 69 the network apparatus 100 communicates directly with control service layer 9 which provides document management service 123 and printing service 130 thereby bypassing the one or more programs." See the Office Action, page 5, lines 16-19.

Paragraphs 0093 and 0099 of Mihira provide that the document management service 123 and the printing service 130 may alternatively be provided in the control service layer 9.

Mihira at most discloses that an external program can call a program that is provided in a control layer of the composite machine 1. However, according to Mihira, the developer of the external program is required to have detailed knowledge of the numerous control functions in the control layer in order to call such functions in the external program.

As explained above, according to Mihira, a developer of an external program can reach the functions in the control service layer 9 by 1) calling the application programs provided in the application layer of the composite machine; or 2) calling the functions in the control service layer 9 directly. Mihira, however, does not disclose an alternative to reach the functions in the control layer by using an external API that is released to the public in advance, wherein the external API converts received requests into commands supported by the first API. Specifically, in Mihira,

the external API (NCS 31), after receiving a request, does not convert received request to a command supported by the first API. Instead, the function in the control layer is called directly by the API in Mihira. As such, Mihira fails to disclose a combination wherein “the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer,” as recited in claim 1.

In view of the foregoing, claim 1 is allowable. Claims 2-6 and 20 are allowable at least because of their dependency from claim 1.

Independent claims 7, 13 and 18 are allowable at least because they include distinguishing features of the external API program including a second API which converts received requests to a command supported by the first API, bypassing the one or more application programs of the application group stored in the application layer. The remaining pending claims are allowable at least because of their respective dependencies.

#### Claims 4, 10 and 15

Claim 4 recites that the external API program further includes: a first converting unit for extracting predetermined information from the received XML data; and a second converting unit for converting the extracted information to the command supported by the first API.

Support for the above-recited features can be found in Fig. 2 of the present application and the related description. Fig. 2 of the present application illustrates XML data generated by an external user based on the released API, and how the XML data is converted as it is passed from the PC 50 to the control layer 20 via the external API application 36 of the MFP 1 .

Referring to Fig. 2 of the present application, the job requested in this example is to scan an image of a document and subsequently transmit the scanned image to the PC 50 under the following conditions: Number of Pages: 1, Document Size: A4, Orientation of Document: portrait (i.e. vertical) orientation, color document, Scanning Resolution: 600 (dpi), Jpeg High-Compression, File Name: testfile, and Transmission Destination (PC 50 ): abc@minolta.co.jp. As shown in block 1 of the figure, the PC 50 outputs XML data describing information items, such as a document size, and other information items, enclosed in predetermined tags, as parameters for the command.

Referring to block 2 of Fig. 2, when received by the MFP 1 , the XML data is passed via the IO 23 to the XML converter 362 of the external API application 36 where the XML data is converted. Specifically, the XML converter 362 extracts a command and corresponding parameters from the received XML data. The data shown in block 2 is a data string outputted from the XML converter 362 when the PC 50 calls the function "scan" that has been publicly released as the external API 361 .

The data shown in block 2 is then sent to the API converter 363 where it is converted to a format directly executable by the control layer 20 (i.e., to a command supported by the IO/IJC API 24 ). The resulting data is shown in block 3 of Fig. 2.



It is asserted in the Office Action that paragraphs 0097-009 and 0102-0103 of Mihira disclose the features of a second converting unit for converting the extracted information to the command supported by the first API. See the Office Action, page 12, the third full paragraph. Appellants respectfully disagree.

According to paragraphs 0097-009 and 0102-0103 of Mihira, the higher level programs, such as the printing service 130, require job opening of the ECS 35 in the control service layer 9. As illustrated in Fig. 1 of Mihira, ECS 35 is a program that resides in the control service layer 9. Calling a program that resides in the control service layer 9 as disclosed in Mihira does not correspond to using a command supported by the first API. In Mihira, a developer of the external program is required to have detailed knowledge of the various programs in the control service layer 9 in order to invoke opening of those programs. To remove the burden, a first API for the various programs can be provided. However, Mihira does not disclose that data received from the web page application is converted to a command supported by the first API. Therefore, Mihira fails to disclose a combination including "a first converting unit for extracting predetermined information from the received XML data; and a second converting unit for converting the extracted information to the command supported by the first API," as recited in claim 4.

In view of the foregoing, claim 4 is allowable for those additional reasons. Claims 10 and 15 are allowable for reasons similar to those for claim 4.

VIII. Claims Appendix

See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date May 31, 2011

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## VIII. CLAIMS APPENDIX

### The Appealed Claims

1. An image processing apparatus comprising:

a hardware resource that includes at least one of an image forming unit, a read unit, and a display unit;

a control layer;

an external API (application program interface) program; and

an application group including one or more application programs stored in an application layer,

wherein the hardware resource, the control layer, the external API program and the application group are arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and

the application group including the one or more application programs and the external API program are superordinate to the control layer,

the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request, and

the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command as the

first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer;

wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.

2. The image processing apparatus according to claim 1, wherein the control layer passes the received first request to the one or more application programs if the first request is directed to the one or more application programs.

3. The image processing apparatus according to claim 1, wherein the third request is data expressed in an XML.

4. The image processing apparatus according to claim 3, wherein the external API program further includes: a first converting unit for extracting predetermined information from the received XML data; and a second converting unit for converting the extracted information to the command supported by the first API.

5. The image processing apparatus according to claim 1, wherein upon receiving a request relating to execution of a print job, the control layer controls the image forming unit to perform the print job.

6. The image processing apparatus according to claim 1, wherein upon receiving a request relating to execution of a scan job, the control layer controls the read unit to perform the scan job.

7. An image processing apparatus comprising:

a hardware resource including at least one of an image forming unit, a read unit, and a display unit;

a control layer;

an external API (application program interface) program; and

an application group including one or more application programs stored in an application layer,

wherein the hardware resource, the control layer, the application group and the external API program are arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and the application group including the one or more application programs and the external API program are superordinate to the control layer,

the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program, and controls the hardware resource to perform image processing based on the received first request, and

the external API program includes a second API for receiving a second request relating to image processing from an external source and a third request relating to image processing from the one or more application programs, converts,

on receiving either of the second and third requests, the received request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing the one or more application programs of the application group stored in the application layer;

wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.

8. The image processing apparatus according to claim 7, wherein the external API program passes the received second request to the one or more application programs if the second request is directed to the one or more application programs.

9. The image processing apparatus according to claim 7, wherein the second request is data expressed in an XML.

10. The image processing apparatus according to claim 9, wherein the external API program further includes: a first converting unit for extracting predetermined information from the received XML data; and a second converting unit for converting the extracted information to the command supported by the first API.

11. The image processing apparatus according to claim 7, wherein upon receiving a request relating to execution of a print job, the control layer controls the image forming unit to perform the print job.

12. The image processing apparatus according to claim 7, wherein upon receiving a request relating to execution of a scan job, the control layer controls the read unit to perform the scan job.

13. An image processing apparatus, comprising:

a hardware resource including at least one of an image forming unit, a read unit, and a display unit;

a control layer;

an external API (application program interface) program; and

an application group including one or more application programs stored in an application layer,

wherein the control layer is arranged between the hardware resource and the application group including the one or more application programs, and the external API program is arranged superordinate to the one or more application programs in the application group in a hierarchical architecture,

the control layer includes a first API for receiving, with use of a predefined function, a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application

programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request,

the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third request to a command supported by the first API, and passes the command to an appropriate one of the control layer, and the one or more application programs, depending on the requested processing, the command passed to the control layer serving as the first request,

wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API.

14. The image processing apparatus according to claim 13, wherein the third request is data expressed in an XML.

15. The image processing apparatus according to claim 14, wherein the external API program further includes: a first converting unit for extracting predetermined information from the received XML data; and a second converting unit for converting the extracted information to the command supported by the first API.

16. The image processing apparatus according to claim 13, wherein upon receiving a request relating to execution of a print job, the control layer controls the image forming unit to perform the print job.



17. The image processing apparatus according to claim 13, wherein upon receiving a request relating to execution of a scan job, the control layer controls the read unit to perform the scan job.

18. An image processing apparatus comprising:

a hardware resource that includes at least one of an image forming unit, a read unit, and a display unit;

a control layer;

an external API (application program interface) program; and

an application group including one or more application programs stored in an application layer,

wherein the hardware resource and the programs are arranged in such a hierarchical architecture that the control layer is superordinate to the hardware resource, and the one or more application programs and the external API program are superordinate to the control layer,

the control layer includes a first API for receiving a first request relating to image processing from the external API program and a second request relating to image processing from the one or more application programs, and controls, on receiving either of the first and second requests, the hardware resource to perform image processing based on the received request, and

the external API program includes a second API for receiving a third request relating to image processing from an external source, converts the received third

request to a command supported by the first API, and passes the command as the first request to the control layer, bypassing one or more application programs of the application group stored in the application layer;

wherein commands, parameters, and syntax for controlling the hardware resource are released to the public for incorporation by external users into software supported by the second API,

wherein the software is used to control the hardware resource to perform processing that is not executable by the hardware resource under control of any of the one or more application programs.

19. The image processing apparatus according to claim 18, wherein the second API is an external API for controlling operations of the hardware resource according to requests received from an external device.

20. The image processing apparatus according to claim 1, wherein the second API includes a function callable by the external source, wherein the function calls a plurality of functions that are predefined by the control layer.

21. The image processing apparatus according to claim 7, wherein the second API includes a function callable by the external source, wherein the function calls a plurality of functions that are predefined by the control layer.

22. The image processing apparatus according to claim 13, wherein the second API includes a function callable by the external source, wherein the function that calls a plurality of functions that are predefined by the control layer.

23. The image processing apparatus according to claim 18, wherein the second API includes a function callable by the external source, wherein the function calls a plurality of functions that are predefined by the control layer.

## IX. EVIDENCE APPENDIX

None

## **X. RELATED PROCEEDINGS APPENDIX**

None